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**NAVAL WAR COLLEGE  
Newport, RI**

**THE OPERATIONAL ASPECT OF NONLETHAL WEAPONS; MORE THAN JUST A  
TACTICAL CAPABILITY**

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**A paper submitted to the faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.**

**The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.**

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**14 February 2005**

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## **Abstract**

The benefits of nonlethal weapons, both politically and morally, are the ability to incapacitate the enemy without killing him and to minimize collateral damage. Development and employment of nonlethal weapons will increase as these concerns will certainly influence the policymakers within the government. Nonlethal weapons are not meant to eliminate the need for lethal weapons but rather to complement them and provide additional options. Within the spectrum of force, nonlethal weapons provide the operational commander the means necessary to dominate that portion between diplomacy and lethality. The current lethal options have their limitations. The main limitation is the lack of options between utilizing lethal force and doing nothing. Options that fall “in between” need to be incorporated into all levels of combat so that the commanders are allowed to respond to differing threats with the appropriate response. These options are especially important due to the operational commander being increasingly tasked to achieve his objectives while minimizing casualties and collateral damage.

### **Operationally Speaking...**

Nonlethal weapons are a reality that is here to stay. No longer are the alternatives on the battlefield either do nothing or kill the adversary. Nonlethal weapons now provide a third alternative and give new meaning to Captain Kirk's famous statements, "Set your phasers on stun!" and "Fire photon torpedoes!" from the 1960-1970's television show, "Star Trek". The benefits of nonlethal weapons, both politically and morally, are the ability to incapacitate the enemy without killing him and to minimize collateral damage. Development and employment of nonlethal weapons will increase as these concerns about killing/collateral damage will certainly influence the policymakers within the government.

Nonlethal weapons are not meant to eliminate the need for lethal weapons but rather to complement them and provide additional options. Within the spectrum of force, nonlethal weapons provide the operational commander the means necessary to dominate that portion between diplomacy and lethality.<sup>i</sup> To maximize the potential capabilities of nonlethal weapons, implementation at all levels of warfare is necessary and can be considered the "missing link" that will enable the military to readily adapt to the changes in modern warfare. The focus of this paper will be on determining when, where and how to use nonlethal weapons at the operational level of warfare.

Due to the relatively broad definition of the term nonlethal, clarification of this term as it pertains to this paper is necessary before proceeding further. Nonlethal weapons are weapon systems that are explicitly designed and primarily employed to incapacitate personnel or material, while fatalities, permanent injury to personnel and undesired damage to property and environment are minimized.<sup>ii</sup> This definition includes counter-personnel, counter-material and counter-capability categories.

Negative media coverage on the effects lethal weapons have in warfare, especially when used on noncombatants either directly or indirectly, is one reason for the introduction of nonlethal weapons into all levels of combat operations. Another reason is the American public's low tolerance for casualties and conflicts that potentially require a lengthy commitment of US troops. Lastly, economics is also a key factor in nonlethal weapons implementation. Savings in dollars, time and manpower will be realized not only in the reconstruction of the infrastructure of the belligerent nation, but also in the amount of time the US is committed to remain in-country during the post-hostilities phase. These are major reasons why their utilization on the battlefield and implementation into all levels of warfare will only increase in the future. These reasons are especially applicable to the operational commander as he considers the assets required to defeat the adversary and throughout the deliberate and crisis action planning process.

In order to capitalize on this alternate means of coercion against the enemy, effective tactics, techniques and procedures (TTP) and doctrine must be implemented. The Joint Tactical Employment of Nonlethal Weapons publication released in January 2003 that describes multi-service TTP for nonlethal weapons is a definite step in the right direction. The other area where nonlethal weapons development is critical is in the arena of doctrine. Currently, doctrine does not exist solely for nonlethal weapons; it can only be found as a reference in other joint publications. In order for nonlethal weapons to truly break free from the tactical realm it needs to be melded into the operational and strategic level and utilized effectively to gain maximum effect. An independent task force sponsored by the Council on Foreign Relations has concluded that nonlethal weapons which are incorporated into the

equipment, training, and doctrine of the armed services could substantially improve U.S. effectiveness in conflict, post conflict, and homeland defense.<sup>iii</sup>

### **Integration of Nonlethal Weapons Beyond the Tactical Level**

One of the most important operational functions is command and control. In order for the operational commander to attain his objectives he must continually monitor the situation and supervise the actions of his subordinates. Due to the development of the common operational picture and the ability of intelligence assets to provide real time information, the operational commander can influence the battlefield like never before. The integration and employment of nonlethal weapons into the courses of action, and the sequels and branches developed during the planning process, will ensure the operational commander has options regarding lethality and non-lethality in deciding his course of action. Milan Vego's statement, "Tactics must create the prerequisites for operational or strategic success, which the operational commander must then exploit" is very applicable in this situation<sup>iv</sup>. The operational commander must exploit these tactics, lethal or nonlethal, to achieve success and ensure harmony exists between tactics and the operational objectives. In order for this harmony to exist, the operational commander must have options at all levels of force in order to shape the battlefield to best achieve the objective with minimal casualties, property damage and ill will amongst the indigenous population.

### **The Power of Media**

The argument exists that having nonlethal weapons is only confusing to soldiers by providing them with more options and is actually doing more harm than good. However, several soldiers from Operation Iraqi Freedom (OIF) who have had direct experience with nonlethal weapons believe they have definite value. Nonlethal weapons give the soldier a

way out of situations while leaving few casualties, if any at all, vice having to choose between one of two options - use lethal weapons or nothing at all. Nonlethal weapons not only bridge this gap between lethal weapons and doing nothing, they can prevent public relations disasters.<sup>v</sup> The “CNN effect”, a military term for news media’s constant coverage of US military operations, seems to be always present in combat operations. Any inappropriate use of deadly force is instantly broadcast to the world, which can have a devastating effect on the support the troops are receiving from not only the local populace but also from the domestic and international community. Lastly, the constant presence of TV cameras may cause soldiers to hesitate in their decision of whether to use deadly force.<sup>vi</sup> The availability of nonlethal weapons, in conjunction with lethal weapons, and the application of corresponding rules of engagement (ROE), will likely eliminate any reason for hesitation due to the reduced likelihood of fatalities.

Figure 1 (all figures are author’s creation) demonstrates the three options available when ground forces confront a situation that requires a decision in the use of force. The option chosen will determine the results and potential effects. As the figure depicts, if threatening to use force is not effective, this only leaves two remaining options. This puts the soldier in a dilemma and does not provide him with answers to those situations that are not clearly black and white.

Figure 1  
Current Force Continuum for Ground Forces

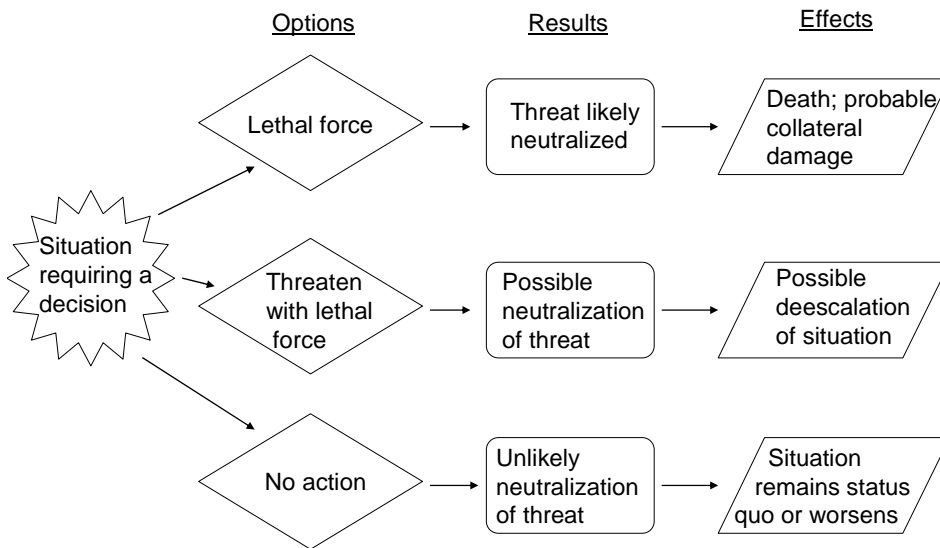
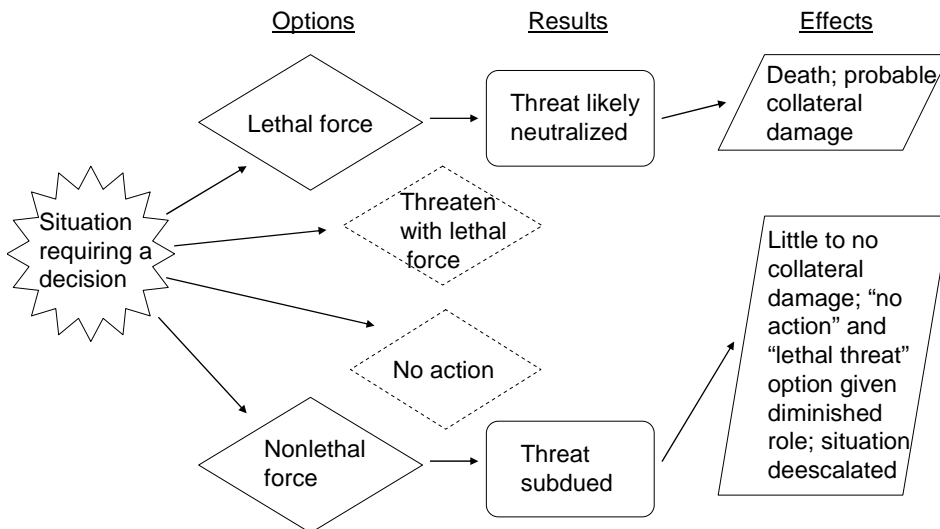


Figure 2 demonstrates what happens when nonlethal weapons are introduced into the decision matrix of the ground forces.

Figure 2  
Force Continuum with Nonlethal Weapons



Although the soldier still has the option of “do nothing” or “threaten to use lethal force,” these two options become less likely due to the introduction of another choice to the soldier’s dilemma - one that provides him an alternative to those situations that are “gray” in nature. Therefore, the individual soldier will not have to constantly go down the lethality path or take-no-action path, in subduing the threat or when facing a situation requiring action. This “other” option of nonlethal weapons will not only lessen the impact of the CNN effect but also allow the individual soldier to react faster to a given situation, especially when he knows the use of lethal weapons may only worsen the immediate situation (tactical) and possibly be broadcast around the world (strategic). This is another demonstration of how employment of nonlethal weapons can lessen the consequences of action taken at the tactical level.

Nonlethal weapons have the effect of deescalating situations, containing them at manageable levels and reducing long term costs. Employing nonlethal weapons directly correlates to keeping the casualty count of civilians down to a minimum and reducing the destruction of infrastructure. Therefore, the post-hostilities phase will be considerably shorter due to insurgents not having two key factors - death and destruction of civilians and infrastructure - to gain popularity and support against US forces during this phase. Lastly, the cost savings potential due to less time rebuilding destroyed infrastructure is substantial when reviewing the cost per week (approximately one billion dollars) that is currently being spent on the post-hostilities phase in OIF.

### **Applying Rules of Engagement to Nonlethal Weapons**

At the operational level, the commander will be able to custom tailor improved rules and operational procedures that ensure the forces available are utilized in a manner that is proportionate to that required by the situation and mission.<sup>vii</sup> Admittedly, the addition of

nonlethal weapons may appear to be making ROE even more complex and troublesome to the commander. However, in reality nonlethal weapons actually provide the commander with precision not previously available in the application of force when applying ROE. Commanders can now deal with restrictive targets that previously presented serious challenges due to the precautions and restrictions imposed by higher authority.<sup>viii</sup>

Due to the current trend of regional-based conflicts and the subsequent house-to-house fighting necessary to defeat the adversary (Military Operations in Urban Terrain (MOUT)), clear ROE should also be delineated. Since one of the primary elements of ROE is self-defense, US troops should not be required to use nonlethal force before shooting to kill an enemy intent on their destruction. Hence, it must be made clear in the ROE that the availability of nonlethal weapons should not preclude or limit the use of lethal weapons as a unit and individual self-defense measure.

### **A Snapshot of Nonlethal Weapons and Their Capabilities**

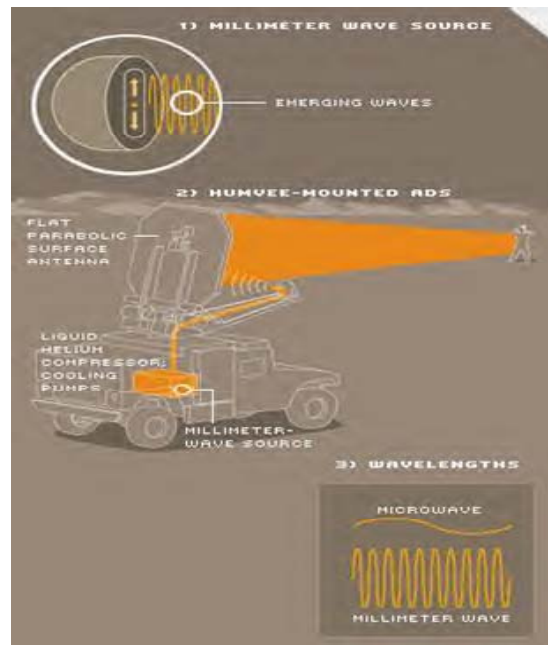
The following four nonlethal weapons described in detail are only a few of the weapons currently under development or being acquired for the U.S. military (the following pictures are from the *Joint Non-Lethal Weapons Program Smart Pack*).



## Mobility Denial System

First, is the Mobility Denial System (MDS). This system dispenses anti-traction material that can be dispersed over roadways or other surfaces via either a man-portable dispensing system or a vehicle mounted dispensing system, which makes it impossible for the enemy or their vehicles to effectively navigate or operate on it. The material is a fluid that has the friction coefficient of ice and makes any area sprayed with it instantly impassable.<sup>ix</sup> This system would be especially effective if placed around key buildings, airfields and bridges in order to deny the adversary the ability to access security perimeters via wheeled vehicles or foot traffic.<sup>x</sup>

## Active Denial System



Second, is the Active Denial System (ADS), which uses millimeter wave energy that heats the moisture in the top layer of the skin and causes intense pain. Once the target(s) move out of range the pain subsides and leaves little to no damage. It is considered a directed energy weapon system and could be mounted on a HMMWV. This system would be ideal for mob control and rioters due to its ability to be operated beyond small arms range.



Advanced Tactical Laser

Third, is the advanced tactical laser (ATL) which is mounted in a C-130 and is capable of disabling or destroying equipment such as vehicles, communications stations, weapons and other infrastructure. Collateral damage would be minimal to none due to its ultra precision strike capability.



## Pulsed Energy Projectile

Lastly, is the pulsed energy projectile (PEP), which is a directed energy weapon that would have the added feature of multiple/tunable target effects (distract, deter, disable). It also has a range that extends beyond that of small arms fire. The projectiles fire packets of plasma energy that pummel and disorient people with a shockwave that knocks them to the ground and has a kinetic effect on the individual's nervous system. Among its capabilities are: denying access to controlled areas, crowd control and separating belligerents. Formal review will be completed by FY-06 at which time acquisition of this item will be decided.

Currently available to the commander are nonlethal capability sets that are prepositioned around the world for quick access (COTS nonlethal weapons). This versatile package ranges from 37 to 46 items consisting of nonlethal weapons, training devices, support equipment and force protection equipment. Nonlethal items currently available via

COTS consist of tasers, lightweight shotgun systems, high intensity directed acoustics, tactical unmanned ground vehicle and the X-net system (spiked net vehicle stopper).

The future development and utilization of nonlethal weapons is only constrained by the imagination and the laws of physics. Future weapons include multi-sensory stimuli weapons, vehicle stopper programs based on high-powered microwaves, smart laser dazzlers and neuromuscular disruption weapons, to name a few.<sup>xi</sup> The operational commander would be able to use the non-lethal capabilities of these and other nonlethal weapons in denying the enemy access to sites of strategic or operational significance, such as key buildings or airfields, keeping vehicles off key bridges leading to the operational objective, crowd/riot control surrounding major geographic areas, force protection and multiple vehicle interdiction.

The nonlethal weapons currently under acquisition or development by the Joint Nonlethal Weapons Program (JNLWP) will expand the operational commander's options in the future regarding the employment of nonlethal weapons. Collateral damage regarding noncombatants and the infrastructure would be minimized, and most importantly, these nonlethal weapons would give the operational commander the ability to custom tailor how the achievement of his objective would occur within the entire spectrum of force.

### **The Practical Use of Nonlethal Weapons**

Nonlethal weapons have had relative success in military operations other than war (MOOTW), but have not really been tested in conventional warfare in the hostilities stage, or even given a particular role to fulfill at the operational level. The following three case studies demonstrate the dilemmas and irritation that commanders often encounter regarding the use of lethal force, especially with regard to the restrictive ROE that often accompanies

this level of force. The situations the commanders found themselves in were catalysts which influenced their desire to implement effective nonlethal weapons that counterbalanced the dilemma they were confronted with during the various stages of conflict.

### **Somalia, 1992 – Operation United Shield**

The first real attempt at employing nonlethal weapons during a conflict was in Somalia. Even though this operation was designed to evacuate the UN Forces, it is an excellent example of the capability of nonlethal weapons. Because the commander did not have any other viable options but the use of conventional weapons, collateral damage to the indigenous civilian population occurred regularly. This fact, and the embedding of the media with their real time coverage, made it very difficult to gain the civilian populace's and the international community's acceptance and support. This limit of options also limited the commander's ability to effectively handle a wide range of situations. Nonlethal weapons were decided on to give the commander additional options.

The eventual use of nonlethal weapons was limited in nature and consisted mainly of commercial off the shelf (COTS) items (low-impact shotgun rounds, sticky and aqueous foams and a low-energy laser system), but proved quite effective in intimidation, which is a key factor at any level in the spectrum of conflict. The media was purposely shown the weapons and the troops training on them.<sup>xii</sup> The media's coverage of this not only informed the international community, but also the Somali warlords, of our intentions to bring alternatives to lethal weapons, albeit US forces would continue to return fire by conventional weapons if fired upon. Lastly, the training in nonlethal weapons was only provided to a company sized element of Marines due to the detailed training required in their use and employment. The training was critical because these nonlethal weapons, if used improperly

(inside the optimal range), could easily become lethal in nature. This company sized element became a type of quick reaction force that was used as the situation warranted.<sup>xiii</sup>

### **Haiti, 1995 – Operation Uphold Democracy**

The use of nonlethal weapons, albeit not at the outset, proved effective in Haiti due to the employment of Mobile Training Teams (MTT) and situational training exercises provided by the Army. The resort to nonlethal weapons occurred because the rules of engagement stated the troops could not intervene with lethal systems except for self defense. Due to the media coverage of several beatings and killings while the US troops stood by, nonlethal weapons were introduced to prevent these atrocities. Nonlethal weapons gave the ground forces a credible alternative course of action.

### **Bosnia, 1996-1999 – Operation Joint Endeavor**

In Bosnia the US faced a different kind of challenge: one involving the targeting of enemy military personnel and equipment that were collocated with civilian villages, hospitals and other structures.<sup>xiv</sup> This practice was intentional by the adversary, taking advantage of the UN troop commander's desire to restrict injuries to civilians. This severely limited the options available to US forces to eliminate these military threats. US forces could either use lethal weapons and inevitably produce collateral casualties, or ignore the situation altogether.

Although targeting will not be discussed in this paper, nonlethal weapon usage would prevent or preclude placing of military targets next to civilian structures as a viable alternative for the belligerents. The ability to utilize nonlethal weapons from air platforms, especially the type that disables vehicles with pinpoint accuracy, will negate the effectiveness of dispersing military hardware among the population by the adversary. Also, the option of nonlethal weapons will ensure US forces retain the moral high ground, thereby garnering

international support against these types of techniques. Due to the foreseeable future of combat being one in which this tactic will be employed and used to its full advantage, nonlethal measures need to be implemented to ensure this practice is no longer considered a viable option and therefore rendered ineffective to the adversary.

### **Where Nonlethal Weapons Figure Into the Equation**

“The principle role of operational art is to soundly sequence and synchronize the employment of military forces and nonmilitary sources of power to accomplish strategic and operational objectives in a given theater.”<sup>xv</sup> The two types of sequencing are objective and task-oriented sequencing; both can be utilized to achieve the ultimate operational objective. The intermediate objectives that constitute the path to the ultimate objective are usually geographic or consist of established phase lines. Having nonlethal weapons as an option for attainment of the intermediate objectives will ensure the operational commander has the ability to choose the most effective plan that will accomplish the intermediate and ultimate objective(s). At the tactical level, nonlethal weapons are utilized to deny access and protect troops; at the operational level, they are used to accomplish critical objectives and provide flexible deterrent options; at the strategic level, the effective use of nonlethal weapons demonstrates to the international community the restraint used by US forces.<sup>xvi</sup> This is a classic example of the operational level bridging the gap between the tactical and strategic levels and ensuring the tactical level of warfare is employed in such a manner to facilitate the attainment of operational and strategic objectives.

When will the operational commander utilize nonlethal weapons is the next pertinent question. In order to answer that question an understanding of the weapons he has at his disposal is necessary. He must understand their capabilities, potential effects on the

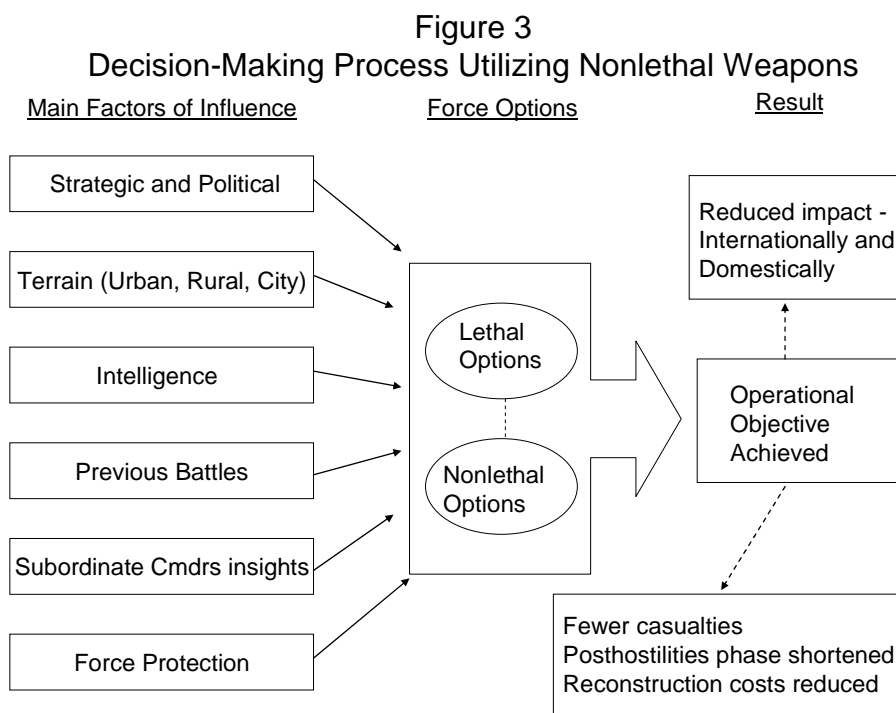
adversary and his own forces as well as any potential negative effects nonlethal force may have compared to lethal options. Use of nonlethal weapons does not mean the exclusion of other conventional type weapons. Defeating the enemy will always be accomplished by whatever means necessary, to include lethal force. The operational commander must understand that by minimizing the adverse effects of lethal weapons in certain situations, especially where noncombatants are involved, the post hostilities phase of warfare will be much shorter in duration and cost.

The operational commander must ensure that proper and adequate training is conducted in order for nonlethal weapons to be effectively employed. This includes unit exercises, simulations and war games at the operational level. Another form of training is the educating of tomorrow's leaders at the respective war colleges regarding the benefits of employing these weapons on the battlefield. This training and education is imperative to ensure all levels of command are aware of nonlethal weapons capabilities and limitations and are comfortable with their employment in combat when the situation dictates.

Contemplating the use of nonlethal weapons by the operational commander should occur whenever the following conditions exist: there will be close contact between friendly forces and noncombatant civilians, the presence of paramilitary or irregular forces or the presence of armed civilian gangs, unlawful combatants or militia.<sup>xvii</sup> Once again, by minimizing casualties, the operational commander can achieve his objectives as well as lessen the enmity and resistance from the local populace that usually accompanies post-hostilities. In fact, support from the population may actually be gained due to the attempt by the liberating nation to minimize civilian casualties. Lastly, nonlethal weapons usage will

garner different psychological reactions from different cultures that must be taken into consideration.

The operational commander, based on input from his subordinate commanders and the J-2 section (intelligence), will be able to determine which nonlethal weapons are most effective and then direct their usage throughout the theater. Figure 3 sums up the various factors of influence that affect the commander's decision to use lethal or nonlethal force to achieve the objective(s). The figure also demonstrates that the complementary use of lethal and nonlethal force results not only in the achievement of the objective; it also positively affects the nature and length of the post-hostilities phase and influences the potential support from the international and domestic arena, and the indigenous population.



The director for plans and programs within the DoD's Office of Defense Research and Engineering further emphasizes this by stating, "You don't want to go into another person's

country with the only option being lethal force, because that will turn the populace against you.”<sup>xviii</sup>

The principles of necessity and proportionality have definite applicability and are explicitly relevant concerning nonlethal weapons. The results for the operational commander when implementing these principles are twofold - legitimacy of operations and minimizing noncombatant casualties and collateral damage.<sup>xix</sup> Utilization of nonlethal weapons in an operational scheme of maneuver is a viable alternative that needs to be explored due to the benefits that incapacitation or immobilizations of large enemy concentrations have for the operational commander.<sup>xx</sup> In achieving the operational objective, it is necessary for the commander to ensure his subordinate commanders not only understand how he envisions the endstate, but also the means of achieving it via nonlethal, lethal or a combination of the two types of weapons. This will place an increased emphasis on ensuring the lethal/nonlethal spectrum is adjusted as necessary (proportionality) during phasing and the effectiveness of nonlethal weapons is evaluated throughout the campaign. Not only does this give the operational commander more options, it also prevents the adversary from taking advantage of the critical vulnerability that was previously manifesting itself in the form of not having any middle ground between employing lethal force and merely maintaining a presence.<sup>xxi</sup>

There are three major categories of nonlethal weapons that the operational commander has available to employ in order to achieve his operational objective: Counter-personnel, counter-material and counter-capability.<sup>xxii</sup> Counter-personnel capabilities include crowd control, individual incapacitation, area denial to personnel and the clearing of structures of personnel. Examples of nonlethal weapons that have this capability are: The active denial system, modular crowd control munitions (device with hundreds of sting balls),

pulsed energy projectile, stingballs, flashbang grenades, and sticky foam, to name a few. As the subordinate commanders provide feedback regarding the counter-personnel measures effectiveness, the operational commander can better understand the overall situation and institute those measures that have proven effective throughout his area of operations. This can be especially beneficial when the counter-personnel measures are effective in one engagement but not in another, or when measures need to be changed in mid-battle by the operational commander based on the success of previous battles.

The next category, counter-material, is capable of area-denial to vehicles, vessels and aircraft, and neutralization of these modes of transportation.<sup>xxiii</sup> Nonlethal weapons capable of providing this effect are: Caltrops (grounded aircraft and vehicles), stinger spike strips (grounded aircraft and vehicles), portable vehicle arresting barriers (grounded aircraft and vehicles), mobility denial system (grounded aircraft and vehicles), advanced tactical laser device (grounded aircraft, vehicles and vessels) and the running gear entanglement system (vessels) are some examples. The utilization of counter-material measures to attack the adversary's weapons and deny them access to key infrastructure (power grids, airfields, bridges, structures) would provide the operational commander options that would decrease the potential threat posed by the adversary, as well as facilitate in the achievement of the operational and strategic objectives. Utilization of counter-material measures would also shorten the post-hostilities phase due to reduced collateral damage to infrastructure during the initial stages of combat operations. The fewer noncombatant casualties, coupled with the fact US forces are attempting to prevent unnecessary killing and damage to infrastructure (state and privately owned), will lessen the potential recruiting pool for the insurgents and lessen the animosity between the local populace and the U.S. military.

The last category, counter-capability measures, includes the disabling or neutralization of Command, Control, Communications, Computers and Intelligence (C4I) systems, Integrated Air Defense Systems (IADS), optical sensors, electrical generating facilities and navigation capabilities and denying the use of Weapons of Mass Destruction (WMD). The mobility denial system and the advanced tactical laser device are two nonlethal weapons that can be utilized for counter-material purposes in disabling these key capabilities the adversary may possess. The implementation of counter-capability measures would also substantially shorten the post-hostilities phase and facilitate the achievement of the operational objectives(s).

There are several nonlethal weapons that the operational commander has or will have at his disposal in the not so distant future. The capabilities of nonlethal weapons continue to be improved upon with new ones in various stages of development and acquisition. Depending on the situation, the operational commander would have the ability to custom tailor the means to achieve his operational objectives with both nonlethal and lethal weapons. As nonlethal weapons become more sophisticated the operational commander would be able to increasingly integrate nonlethal weapons into the courses of action; thereby giving him more flexibility in accomplishing his mission while still adhering to the external factors (national and strategic) affecting his decisions.

### **In Conclusion, It Is All About Options**

The current lethal options have their limitations. The main limitation is the lack of options between utilizing lethal force and doing nothing. Options that fall “in between” need to be incorporated into all levels of combat so that the commanders are allowed to respond to differing threats with the appropriate response. These options are especially important due to

the operational commander being increasingly tasked to achieve his objectives while minimizing casualties and collateral damage. These options present themselves in nonlethal weapons. There are several ways nonlethal weapons can be utilized: deter or preempt conflict, separate belligerents and allow for “cooling off”, encourage negotiation, protect noncombatants, facilitate disaster relief and humanitarian assistance operations, enhance the effectiveness of lethal weapons and other instruments of national power, and reduce risks to US forces.<sup>xxiv</sup>

Due to their lack of lethality, nonlethal weapons should rarely be employed against the adversary without support from conventional arms. This can only happen by incorporating them into exercises, live fires, simulations and war games. This incorporation of nonlethal weapons will give the commanders the assurance and confidence in their employment as a bona fide method to achieving the objective. It is especially important for the operational commander to transfer this confidence in the abilities of nonlethal weapons to his subordinates. The implementation into the operational commander’s planning and operations plan legitimizes nonlethal weapons and ensures subordinate commanders utilize them in the achievement of their objectives.

Proper usage and employment will have long-term effects on how campaigns are fought that will benefit not only the troops on the ground but also the noncombatants that are being increasingly exposed to combat operations. Furthermore, the nonlethal weapons capability fully supports the National Military Strategy by providing the means for flexible and selective engagement.<sup>xxv</sup> The prevention of loss of life for the noncombatants of the aggressor nation and their dwellings has two definite benefits: it lessens the local populace’s resistance to occupation in the post-hostilities phase and helps to prevent insurgency or

opposition groups from attracting supporters. Once the strategic and operational advantages of nonlethal weapons are recognized, only then will they be fully integrated into the arsenal of America's combat forces.<sup>xxvi</sup>

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<sup>i</sup> Steven Metz and Douglas C. Lovelace Jr, *Nonlethality and American Land Power: Strategic Context and Operational Concepts* (Carlisle: Strategic Studies Institute, U.S. Army War College, 1998), 3.

<sup>ii</sup> Department of the Navy, United States Marine Corps, *Joint Concept for Non-Lethal Weapons*, open-file report, Joint Non-Lethal Weapons Directorate, 1 (Quantico, January 1998).

<sup>iii</sup> Jefferson Morris, "Task Force Calls for Major Push in Nonlethal Weapons," *Aerospace Daily Washington* 209, no. 37 (27 February 2004): 1.

<sup>iv</sup> Milan N. Vego, *Operational Warfare*, (Newport: Joint Military Operations Department, U.S. Naval War College, 2000), 6.

<sup>v</sup> Stephen Mihm, "The Pentagon is Developing a New Class of Sci-fi-like 'Nonlethal' Weapons. But Will They Make War any Safer or Easier?" *The New York Times Magazine*, 25 July 2004, 42.

<sup>vi</sup> John B. Alexander, *Future War: Non-Lethal Weapons in Twenty-First-Century Warfare*, (New York: St. Martin's Press, 1999), 163.

<sup>vii</sup> Metz and Lovelace, 4.

<sup>viii</sup> Coppernoll, 114.

<sup>ix</sup> Mihm, 40.

<sup>x</sup> Gilmore, 1.

<sup>xi</sup> Department of the Navy, United States Marine Corps, *Joint Non-Lethal Weapons Program Smart Pack*, open-file report, Joint Non-Lethal Weapons Directorate, 38, 45, 49-50, (Quantico, September 2004).

<sup>xii</sup> Alexander, 24.

<sup>xiii</sup> Senior Military Official, "Background Briefing Subject: Non-Lethal Weapons," interviewed by unnamed interviewer (Office of the Assistant Secretary of Defense (Public Affairs)), *News Briefing*, (17 February 1995) 6.

<sup>xiv</sup> Alexander, 29.

<sup>xv</sup> Vego, 533.

<sup>xvi</sup> Margaret-Anne Coppernoll, "The Nonlethal Weapons Debate," *Naval War College Review* 52, no. 2 (Spring, 1999): 113.

<sup>xvii</sup> Department of Defense, Air Land Sea Application Center, *Tactical Employment of Nonlethal Weapons*, open-file report, Multi-Service Publication, (Langley AFB, VA: January 2003), 23.

<sup>xviii</sup> Gerry J. Gilmore, "DoD Harnesses Technology in Search for Nonlethal Systems," *American Forces Information Service News Articles*, 22 January 2004, 1.

<sup>xix</sup> *Joint Concept for Non-Lethal Weapons*, 3.

<sup>xx</sup> *Ibid.*, 10.

<sup>xxi</sup> *Ibid.*, 7.

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<sup>xxii</sup> *Tactical Employment of Nonlethal Weapons*, 24.

<sup>xxiii</sup> *Joint Concept for Non-Lethal Weapons*, 12.

<sup>xxiv</sup> Nick Lewer, ed., *The Future of Non-Lethal Weapons: Technologies, Operations, Ethics, and Law*, (Portland: Frank Cass Publishers, 2002), 135.

<sup>xxv</sup> *Ibid.*, 7.

<sup>xxvi</sup> Alexander, 213.

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